SECTION 2
LANDSCAPE REQUIREMENTS
(Revised ZA06-0005)

2.00 DEFINITIONS:

Conversion Factor: A number that converts the Landscape Water Allowance and Estimated Landscape Water use from acre-inches per acre per year to gallons per square foot per year. The conversion factor is calculated as follows: (325,851 gallons/43,560 square feet)/12 inches = (0.62)

325,851 gallons = one acre foot

43,560 square feet = one acre

12 inches = one foot

Director: The Director of Planning & Development Services or his/her designee.

Estimated Landscape Water Use (ELWU): The annual total amount of water estimated to be needed to keep the plants in the landscape area healthy, it is based upon the local reference evapotranspiration rate, the size of the landscape area, the types of plants, and the efficiency of the irrigation system.

ET_0 Adjustment Factor: A factor applied to reference evapotranspiration that adjusts for plant coefficients and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape. For the purpose of this example, the plant coefficient (Pc) shall be 0.3 and irrigation efficiency shall be 0.6. Therefore,

Example: ET_0 Adjustment Factor = (0.3/0.6) = 0.5

ET: Evapotranspiration: Loss of water from the soil both by evaporation and by transpiration from the plants growing thereon.

ET Based Controller: An irrigation controller that automatically makes adjustments of run times, based on local weather data. The ET Based Controller adjusts automatically to apply only the amount of water that is necessary to replace what has been lost.

Evapotranspiration, reference (ET_0): The rate of evapotranspiration from a hypothetical reference crop that is assumed to be free of water stress and disease.

Irrigation Efficiency: The measurement of the amount of water beneficially used by plants divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices.

Irrigator: A person who holds a license to practice irrigation in the State of Texas.

iSWM: Integrated Storm Water Management, a site development design manual developed by the North Central Texas Council of Governments (NCTCOG).

Landscape Architect: A person who holds a license to practice landscape architecture in the State of Texas.

Landscape Water Allowance (LWA): For design purposes, the upper limit of annual applied water for the established landscape area. It is based upon the local reference evapotranspiration rate ET_0, the ET_0 Adjustment Factor and the size of the landscape area.

Landscape Zone: A portion of the landscape area having plants with similar water requirements, site conditions or functions. (See Natural Landscape Zone, Rainwater Harvest Zone, and Oasis Zone).

Microirrigation: A low pressure, low volume irrigation system that applies water only to the plant's root zone, saving water as a result of application efficiency and distribution uniformity. Drip and microspray irrigation are examples of microirrigation.

Natural Landscape Zone: A landscape zone that requires native and adapted plant selections that can thrive after establishment with little or no supplemental water with the intended purpose of conserving water.

Oasis Zone: A Landscape Zone where landscape designs allow for the use of Non-drought Tolerant Plants and efficiently applied irrigation.

Plant Coefficient (Pc): A coefficient that, when multiplied by the reference evapotranspiration rate, estimates the amount of water used by plants.

Rainwater Harvesting Zone: A landscape zone that is designed for the purpose of capturing, filtering, reusing or infiltrating rainwater with the intended purpose of protecting and conserving water resources.

Structural Soil: A soil medium, developed by Cornell University, which is designed to meet or exceed pavement load bearing requirements while remaining root penetrable and supportive of tree growth.

Temporary Irrigation: An irrigation system that is used to establish native and adapted plants species and is removed after a one year establishment period.

2.01 PURPOSE AND INTENT:

The purpose of this Article IV, Section 2 is to provide landscape elements which conserve water, moderate air temperatures, reduce pollution, and minimize erosion and flooding thus enhancing the community's health, welfare and general wellbeing.

A. Objectives.

The following criteria shall be used to evaluate proposed landscape plans:

1. The landscape design should have proportion, balance, unity, variety of species, and a variety of color throughout the seasons.
2. Landscape designs should define spaces including entrance areas, pedestrian paths, vehicular avenues, parking areas, sitting areas, etc.
3. As an architectural feature, landscape designs should visually soften the mass of the buildings, parking areas, and other structures.
4. Indigenous landscape materials should be selected whenever feasible.
5. Landscaping should:
    a. Reduce the reliance on irrigation, thus conserving the public water supply;
    b. Minimize erosion pursuant to iSWM guidelines;
    c. Allow groundwater recharge pursuant to iSWM guidelines;
    d. Shade seating, walking and outdoor activity areas;
    e. Provide a barrier between vehicles and pedestrians;
    f. Diminish the intrusion of headlights and other glare;
    g. Provide a natural habitat for birds and other wildlife;
    h. Shield buildings from winter wind and summer sun thereby conserving energy; and

i. Enhance overall character and ecological function of the site through and restoration of native vegetation, and eradication of invasive species.

2.02 SCOPE:

A. Applicability.

This Section 2 shall apply to all new development and existing developments that are expanding or redeveloping thirty percent (30%) or more land or building or both of that development with the following provisions:

1. Landscape Documents pursuant to Article IV, Section 2.03 are not required for Single Family (SF), Two Family (2F) and Townhome (TH) lots, except for model homes. Single Family (SF), Two Family (2F), and Townhome (TH) lots shall comply with Home Builder Installed Landscapes under Article IV, Section 2.05 and Residential Irrigation Design Standards under Section 2.06.
2. Home Owner Associations (HOA's) and Covenants, Codes and Restrictions (CCR's) for residential developments shall not over rule the provisions of this Section 2 by penalizing or restricting water conserving landscapes, or requiring landscape materials that do not comply with this Section 2.
3. The following projects shall be exempt from this Section 2:
    a. Cemeteries;
    b. Ecological restoration projects and landscape designs that do not require a permanent irrigation system;
    c. Landscaping that is irrigated solely with reclaimed water or storm water where a connection to the City water system is not proposed; and
    d. Public parks, and recreation areas, golf courses, street medians and school playgrounds.
4. All open space and landscape areas required by ordinance shall comply with the standards of this Section 2. Refer to the following:
    a. Article III, Zoning Districts.
    b. Article III, Section 3. Special Districts.
    c. Article IV, Section 5. Screening Fence and Wall Standards.
    d. Article IV, Section 9. Special and Additional Regulations, Non-residential and Multifamily Development Adjacent to a Major Creek.
    e. Article IV, Section 11. Retail Design Standards.
    f. Original Downtown Architectural Standards.
    g. Subdivision Regulation Ordinance, 7.09 16. Required Improvements (16). Thoroughfare Screening.

B. General Standards.

1. The best professional practices of the American Society of Landscape Architects, the International Society of Arboriculture and the American Nursery and Landscape Association regarding planting, installation, trimming, and fertilization, shall apply to this Section 2.
2. Nursery standards shall be: American Standard for Nursery Stock, ANSI Z60.1-2004.
3. City of Frisco Engineering Design Standards.

C. Approval process.

1. The provisions of this Section 2 shall be administered and enforced by the Director.
2. The required landscape documents shall be submitted for review with the Site Plan required in Article IV, Section 1 of this Ordinance.
3. Permits for building, paving, utilities, or construction shall not be issued prior to an approval and construction release of required landscape documents by the City, unless approved by the Director.
4. Tree Preservation requirements shall be met prior to construction release with a tree permit obtained pursuant to Article IV, Section 3, prior to removal of trees and existing site vegetation.
5. An approved Landscape Plan shall expire at the same time that the approved site plan with which it was submitted expires.

D. Landscape Inspections.

1. The installation of the approved landscape plan shall be inspected and approved by the Planning & Development Services Landscape Architect prior to the issuance of a certificate of occupancy.

   If a certificate of occupancy is sought during a season of the year in which the City determines that it would be impractical to plant trees, shrubs or grass, or install turf, the developer/owner will put in escrow with the City a sum of money equal to the cost of installing all or the remaining portion of the approved landscape plan.

   a. In lieu of paying cash, the developer/owner may provide financial assurance of payment of the cost of installing the landscape plan acceptable to the Director, which will remain in effect until the landscape plan is installed and accepted by the Director.
   b. The landscape plan will be installed within five (5) months of final acceptance of the development by the City or issuance of the first certificate of occupancy within the development.

E. Maintenance.

The property owner shall be responsible for the maintenance of all landscaping required and approved by this Ordinance pursuant to:

1. All plant material shall be perpetually maintained in a healthy and vigorous condition as is appropriate for the season of the year.
2. Plant materials that die shall be replaced by the property owner with the same plant variety and size, within thirty (30) days or a date approved by the Director.

F. Enforcement.

In the event a landscape does not comply with the approved Landscape Plan or the requirements of this Section 2, the City will cite the violation pursuant to the following requirements:

1. The property owner shall have thirty (30) days from the date of said notice to comply with the approved Landscape Plan and the requirements of this Section 2.
2. If after (30) days the landscape is still not in compliance with the approved Landscape Plan and the requirements of this Section 2, the property owner, shall be in violation of this Ordinance. In addition to any other remedy available to the City, the certificate of occupancy for that property may be revoked.

2.03 REQUIRED LANDSCAPE DOCUMENTS:

A. Project data sheet shall provide all of the following:

1. Project name and address.
2. Project's city case number.
3. Applicant or applicant's agent name, address, phone, fax number, and email address.
4. Landscape architect's name, address, phone, fax number, and email address.

B. Landscape Plan.

Proposed landscape plans shall be prepared by a Landscape Architect, be submitted on (24"x36") sheets of paper and shall include the following information:

1. Minimum scale of one-inch (1") inch represents thirty (30) feet or appropriate engineer scale for legibility.
2. Site information including:
    a. Property lines.
    b. Existing and proposed structures.
    c. Parking and paved areas.
    d. Utilities.
    e. Easements.
    f. Detention & retention facilities.
    g. Other site improvements.
3. Dedicated Visibility, Access and Maintenance Easements (VAM's) pursuant to City Engineering Design Standards.
4. Location, size and species of all existing trees to be preserved indicating true size as measured four and one-half feet (4½') above natural soil level. For specific tree preservation and tree removal requirements, refer to tree preservation requirements Article IV, Section 3.
5. Location of replacement trees pursuant to Article IV, Section 3.
6. Designation of Landscape Zones used to calculate the ELWU pursuant to Article IV, Section 2.04(B) and 2.05.

7. Location of all plants and other landscape materials, a legend with botanical and common names, and sizes of plant materials.
8. Size of all plant material to be used at time of planting, appropriate spacing shall be indicated on plan.
9. Details and specifications for tree planting, soil preparation, and other applicable planting work.
10. Landscape architect's seal with signature.
11. North arrow.
12. Date of the Landscape Plan and any revisions.
13. Details and/or cross sections as required for clarification by the City.
14. Landscape tabulations showing how landscape requirements have been met.
15. Existing and proposed topography using spot elevations and/or contours at one-foot (1') intervals to define proposed landscape grading and drainage.

C. Irrigation Plan.

A detailed irrigation plan shall be prepared by an Irrigator or Professional Engineer (PE), at a scale that matches the Landscape Plan and shall be submitted on (24"x36") sheets of paper that include the following information:

1. Layout of the irrigation system that is congruent with the Landscape Zones used to calculate the ELWU pursuant to Article IV, Section 2.04(B) and 2.05.
2. Legend summarizing the type and size of all components of the system, including manufacturer name and model numbers.
3. Static water pressure in pounds per square inch at the point of connection to the public water supply.
4. Flow rate in gallons per minute and design operating pressure in pounds per square inch for each valve.
5. Seal of a licensed irrigator or PE.
6. Topography.
7. Meter and Point of Connection.
8. Installation details for irrigation components.

D. Landscape Water Use Calculations.

Landscape Water Allowance (LWA) and Estimated Landscape Water Use (ELWU) calculations shall be included on the Landscape Plans pursuant to Article IV Section 2.04. LWA and ELWU calculations for model homes shall be submitted with building permit application. Building permit application must clearly designate the home as a model. A certificate acknowledging completion of the landscape installation in accordance with this Section must be submitted prior to receiving a certificate of occupancy.

2.04 LANDSCAPE WATER USE REQUIREMENTS:

A. The Landscape Water Allowance (LWA).

LWA shall be calculated for each landscape submittal using the following formula:

LWA= (55.85 x 0.5 x .62) LA

Where,

LWA = Landscape Water Allowance (gallons per year).

55.85 = ET_o = Reference ET in inches per year

0.5= ET_oAF= ET_o Adjustment Factor

0.62 = Conversion Factor (to gallons per square feet)

LA = Total Landscape Area (square feet).

B. Estimated Landscape Water Use (ELWU).

ELWU calculations for each landscape submittal shall consist of summing the ELWU for all landscape zones within the landscape area. The ELWU shall not exceed the LWA. The ELWU for each landscape zone shall be calculated using the following formula:

ELWU= (55.85 x ET_o AF x .62) LZ

Where,

ELWU= Estimated Landscape Water use (gallons per year).

55.85 = ET_o = Reference ET in inches per year

ET_o AF= ET_o Adjustment Factor or Pc/ IE

Where,

Pc= Plant coefficient

IE= Irrigation efficiency

.62= Conversion Factor (to gallons per square feet)

LZ= Area of Landscape Zone (square feet).

The Plant coefficient (Pc) shall be the following for each type of plant material, which are based on an average density planting and average microclimate conditions.

Plant Type	Pc
Oasis Zone Turf	0.6
Oasis Zone shrubs & Ground Cover	0.4
Natural Landscape Zone	0.2
Rain Water Harvesting Zone	0.2

For the purpose of this article, Irrigation Efficiency (IE) shall be the following for each type of irrigation:

Irrigation Type	IE
No irrigation/temporary irrigation removed after 90 days	1.0
Bubblers	0.85
Drip Emitters	0.85
Rotors or stream spray over 10 feet wide	0.6
Spray sprinklers less than 10 feet wide	0.4

An alternative Pc or IE may be approved by the Director in calculating the ELWU if:

1. They are based on a methodology or test data that has generally been endorsed or approved by the landscape profession; or
2. Specific microclimate or soil conditions or landscape design elements warrant their adjustment.

2.05 LANDSCAPE DESIGN STANDARDS:

The LWA shall be met by incorporating a combination of the following standards:

A. Natural Landscape Zone.

Design landscapes that emulate indigenous plant communities and select and locate appropriate plants that are adapted to the conditions of the site and do not require supplemental water from irrigation, except for establishment and periods of extreme drought. For a list of approved plant materials for this zone, see Approved Plant Materials, Article IV, Section 2.08.

B. Rainwater Harvest Zone.

Strategically locate landscape areas, designed to capture and utilize storm water runoff as a source of water for trees and other landscape plants, pursuant to the following options. (For a list of approved plant materials for this zone, see Approved Plant Materials, Article IV, Section 2.08.)

1. Design bio-retention beds, rain gardens, and filter strips etc. to capture runoff from impervious surfaces pursuant to iSWIM guidelines.
    a. Coordinate with Civil Drainage and Storm Sewer Plans and provide detention volume calculations subject to City Engineering approval.
    b. Locate trees and other appropriate plants that are adapted to flood and drought conditions.
    c. Wheel stops or curb cuts shall be provided to allow storm water to flow into rainwater harvest areas.
2. Design a system that stores and reuses storm water in a pressurized irrigation system subject to City Engineering approval. Retention ponds shall not count toward open space requirements unless approved by the Director.

C. Oasis Zone (optional).

Limit the use of moderate to high water use plants to key locations including entrances, facades, and sitting areas. Oasis Zones may be expanded for larger turf areas used for recreation with the approval of the Director. For a list of approved plant materials for this zone, see Approved Plant Materials, Article IV, Section 2.08.

D. Soil Amendments and Mulch.

1. Native soil may be amended with organic and inert amendments to create a healthier soil for root growth and to retain moisture.
2. A three inch layer of fibrous mulch shall be provided in shrub beds and around trees. Mulch shall be pulled back three inches (3”) from base of tree trunk to prevent excess moisture and disease.

E. Home Builder Installed Landscapes.

Single Family (SF), Two Family (2F), or Townhome (TH) developments shall comply with the following:

1. All model home landscaping shall:
   a. Provide Landscape Water Use calculations, pursuant to Article IV, Section 2.04.
   b. Demonstrate the use of Natural Landscape, Rainwater Harvest and Oasis (optional) landscape zones.
2. All basic landscape packages for individual lots shall be drought tolerant and able to survive stage three drought restrictions pursuant to the City Drought Contingency Plan. Bermuda will be allowed as a drought tolerant turf; however, alternative drought tolerant grasses which will remain green while using 50% less water shall be offered as an option.
3. Provide landscape water conservation information to all new home owners.

2.06 IRRIGATION DESIGN STANDARDS:

Landscape irrigation systems shall comply with the City Water Conservation Ordinance as it exists or may be amended and the following standards:

A. Permitted Irrigation Types by Landscape Zone.

Area by Type and Location	Spray heads	Rotors*	Temporary	Drip	Tree Bubblers
Natural Landscape Zone			●	●	●
Rainwater Harvest Zone			●	●	●
Oasis Zone	●	●	●	●	●
R.O.W. landscape areas including medians			●	●	●
10 foot wide landscape strips adjacent to vehicular paving			●	●	●
Slopes greater than 25% (4:1)		●	●	●	●

*Note: maximum precipitation rate not to exceed 0.85 inches per hour.

B. Irrigation Equipment Standards.

Irrigation Component	Design Standards
Backflow prevention device	Required for all irrigation systems connected to the City water system including existing irrigation systems.
Pressure regulating devices	Either section valve or irrigation heads, set at 40 PSI.
Controller	ET based, Automatic, digital multi-programmable with the following: ● Multiple start time programming. ● Minimum 3 cycles preprogram capability. ● Operation information including recommended monthly and seasonal schedules, water budgets

	based on gallons used or landscape planting for year one and year three, with the irrigation plan and documentation. ● Independent rain and freeze shut-off device.

Irrigation Component	Design Standards
Controller, irrigation schedule	● Programmed to achieve the ELWU pursuant to Article IV, Section 2.03(b) ● Program using multiple repeat cycle features to prevent runoff.
Landscape Zones/ valves	Each valve shall irrigate a landscape zone containing plant materials with similar water requirements and similar site, slope and soil conditions.
Gate Valve	Required
Check valves	Required where elevation differences will cause low-head drainage.
Water meter	Separate water meter for irrigation (residential lots are exempt).
Irrigation heads (micro-spray, spray-heads, rotors, etc.)	Shall comply with the following: ● Selected and spaced for maximum distribution and uniformity ● Matched precipitation rates on each zone. ● Have spring retracted pop-up operation. ● Flexible connections. ● Adjust heads to ensure uniform coverage and to prevent overspray.
Drip System	Shall comply with the following: ● Designed to provide water uniformly. ● Sub-grade PVC lateral piping for water distribution

C. Residential Irrigation Design Standards.

Homebuilder installed irrigation systems for individual lots within SF, 2F, and TH districts shall:

1. Furnish and install an ET Based Controller.
2. Have separate zones for a drip system around the foundation to the required trees in the front yard and to the adjacent R.O.W. landscape.

D. Maintenance.

Inspect irrigation system monthly and repair leaks, clogged heads, filters and other problems.

E. Maintenance and Irrigation Audit.

A professional irrigation auditor may be hired to conduct an annual irrigation audit to ensure compliance with the LWA, pursuant to Article IV, Section 2.04 (A).

2.07 LANDSCAPE AREA AND TREE REQUIREMENTS:

A. Residential Tree Requirements.

Residential Zoning District	Number of Medium or Large Trees Required Per Lot	PD Zoning Districts lot size range	Number of Medium or Large Trees Required Per Lot
RE	6	40,000 +	6
SF-1	5	16,000-39,999	5
SF-2	4	10,000-15,999	4
SF-3	4	8,500-9,999	3
SF-4	3	7000-8,499	2
SF-5	2	2,500-6,999	1
OTR	2		
PH	1		
2F	2		
TH	1		

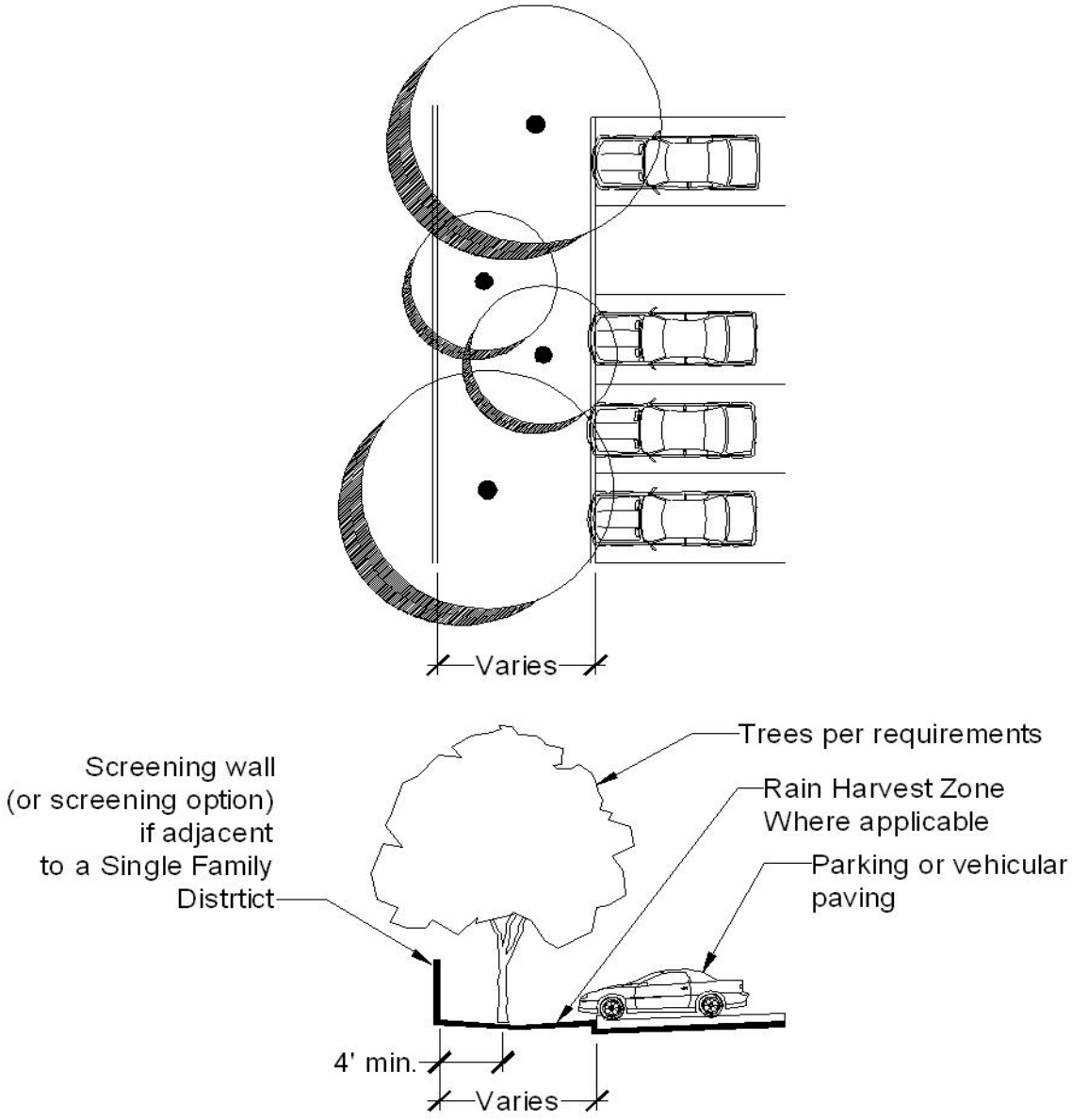
B. Non-Residential and Multifamily Area And Tree Requirements.

Non-Residential and Multifamily Zoning Districts	**Perimeter landscape width (ft.) Adjoining District or Thoroughfare**					**Interior Landscape Area**	**Number of Shade Trees Per**		
	Single Family	Non Single family	DNT, US 380 & SH 121	Type 'A' & 'B'	Collector	Square Feet Per Parking Space	Perimeter Landscape Square Footage	Interior Landscape Square Footage	Front Facade Length (ft.)
MF-1 & MF-2	25	15	-	25	25	20	1/750	1/250 or 1/500	1/40
O-1, O-2 & CO	15	5*	30	25	15	20	1/750	1/250 or 1/500	1/40
R & NS	15	5*	30	25	15	15	1/750	1/250 or 1/500	1/30
OTC	10	5*	30	25	15	15	-	-	-

C-1, C-2	15	5*	30	25	15	15	1/750	1/250 or 1/500	1/30
H	15	5*	30	25	15	15	1/750	1/250 or 1/500	1/30
IT & I	15	5*	30	25	15	15	1/750	1/250 or 1/500	1/50

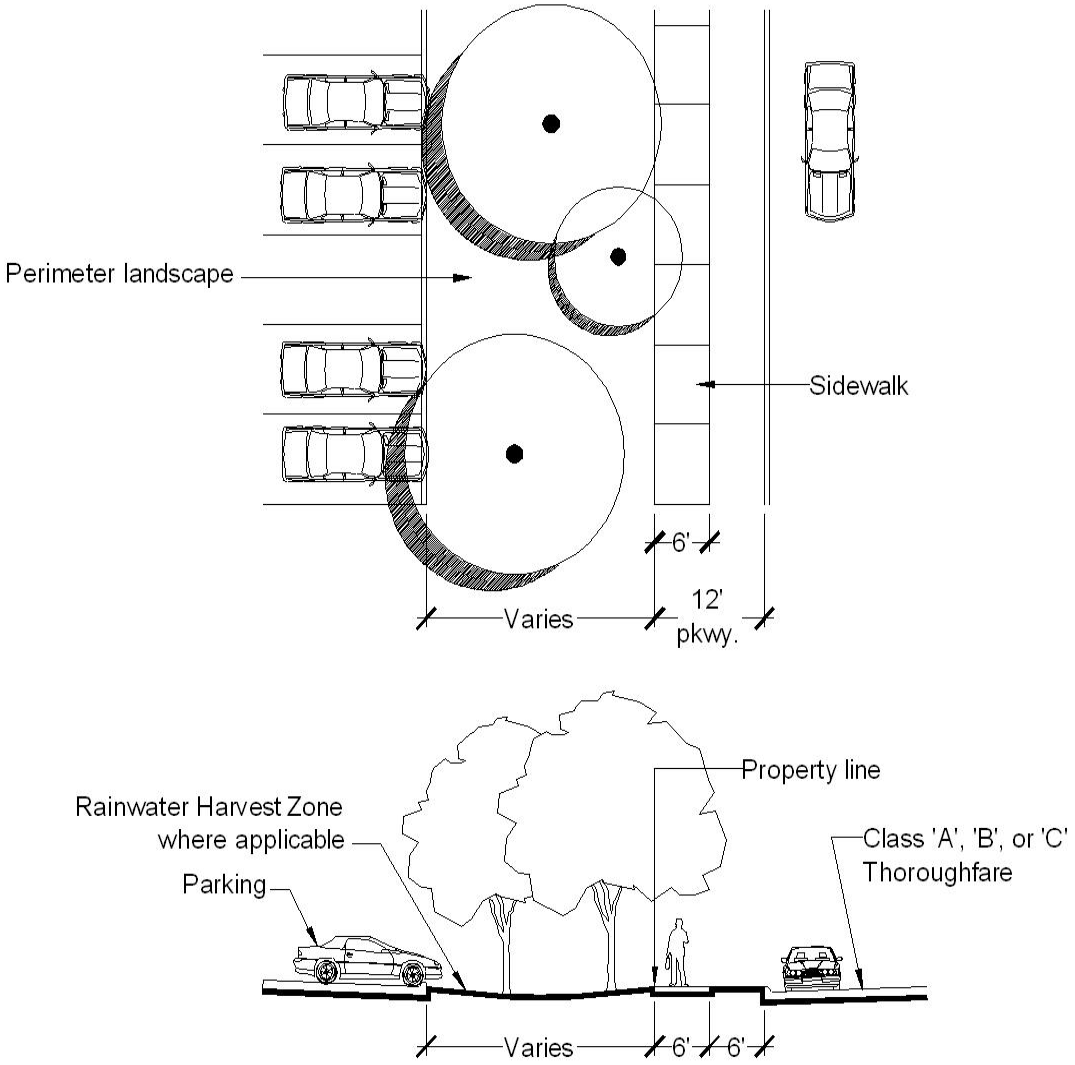
* If the property line is the centerline of a fire lane or drive aisle, the five foot (5') wide landscape area will begin at the edge of the lane/aisle. If the drive aisle or fire lane only allows access to parking spaces, the landscape area may be eliminated or moved at the discretion of the Director. The five foot (5') wide landscape area may be eliminated for a building where the building is attached to another building and the attached buildings are shown on an approved site plan.

1. Perimeter Landscape Tree Requirements (See Figures 2.07-A and 2.07-B)
   a. Perimeter landscape area may contain Rainwater Harvest Zone, pursuant to Article IV, Section 2.05 (B), when adjoined by a parking lot.
   b. Trees may be placed in informal groupings.
   c. Designs shall include adequate screening for adjacent Single Family zoning districts pursuant to Article IV, Section 5.0.



Perimeter Landscape: Adjoining District

Figure 2.07-A

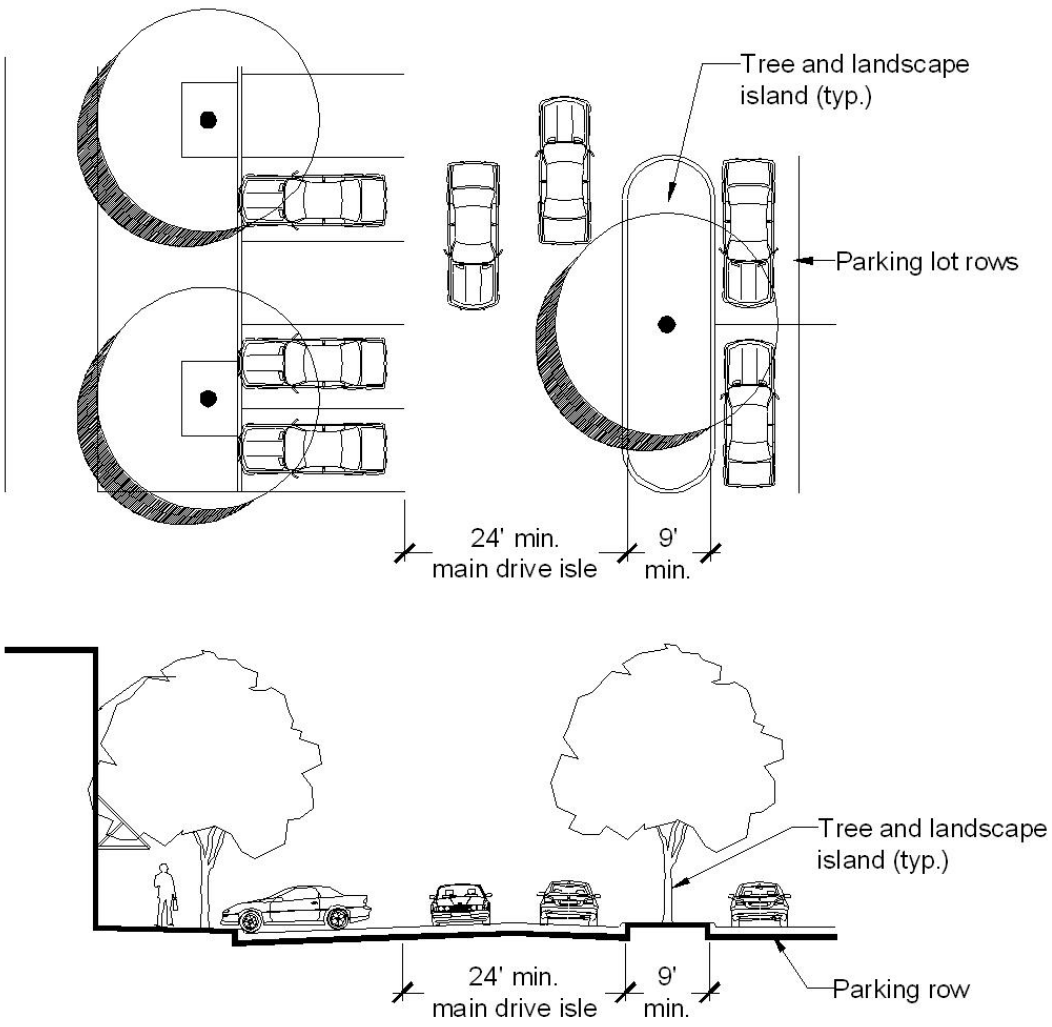


Perimeter Landscape: Thoroughfare

Figure 2.07-B

2. Interior Landscape Tree Requirements

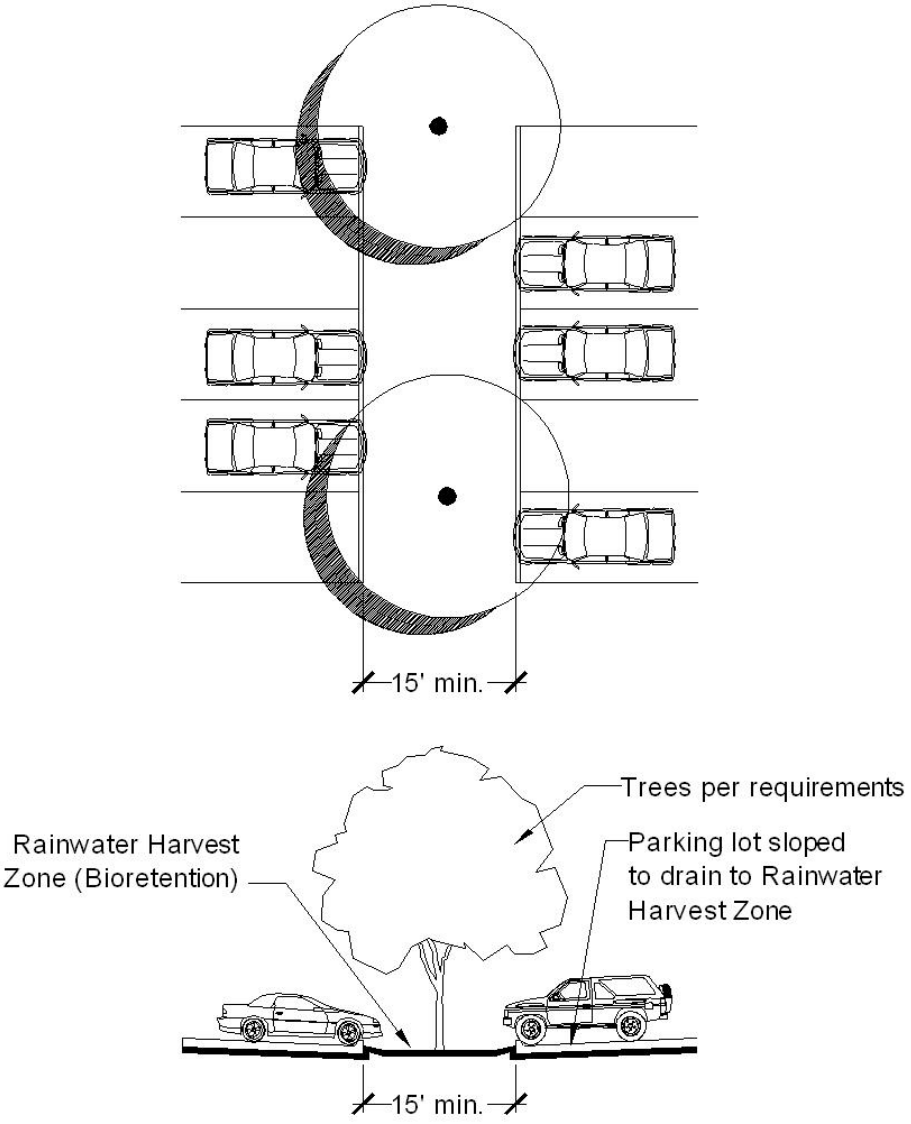
   a. Tree islands are required at terminus of rows of parking along the main drive isle only. See Figure 2.07-C.



Landscape Terminus Island

Figure 2.07-C

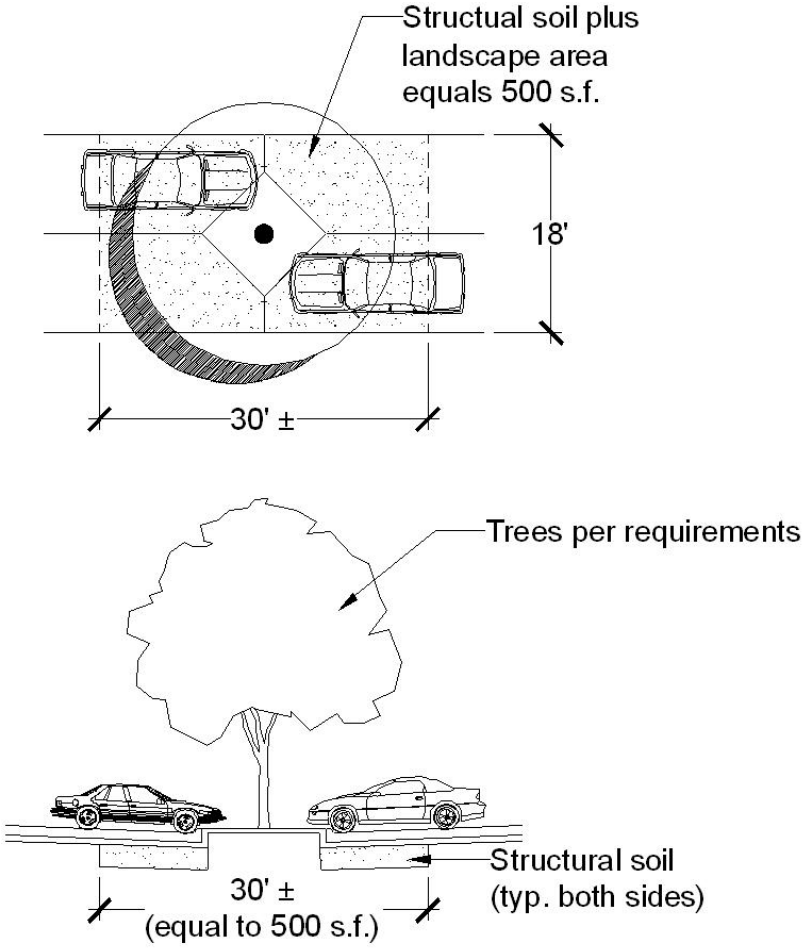
b. Tree Planting Option 1. Trees shall be planted in landscape areas not less than five hundred (500) square feet with a minimum width of fifteen (15) feet. Rate of one (1) tree per five hundred (500) square feet and shall incorporate a Rainwater Harvest Zone pursuant to Section 2.05 of this Article IV. See Figure 2.07-D.



Interior Landscape Option 1

Figure 2.07-D

c. Tree Planting Option 2. Trees shall be planted in landscape areas that are less than five hundred (500) square feet with the use of structural soil and accepted construction practices. The structural soil is to be placed under the load bearing surface encroaching within the five hundred (500) square foot area required for each tree. Rate of one (1) tree per two hundred fifty (250) square feet. See Figure 2.07-E.

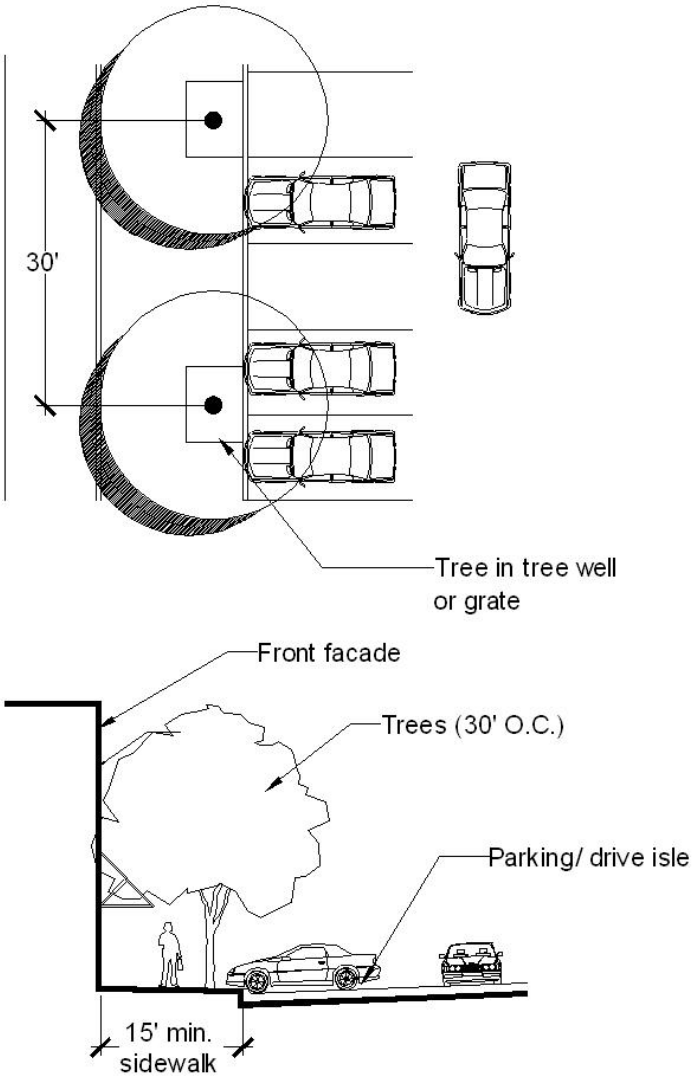


Interior Landscape Option 2
(possible configuration)

Figure 2.07-E

3. Façade Tree Requirements

   a. Retail and Commercial Districts: Shade trees shall be placed in tree grates or tree wells at thirty (30) feet on center within a minimum fifteen (15) feet sidewalk for all structures fifteen thousand (15,000) square feet or greater. Length calculation does not include main vestibule. Façade trees are not required in areas with an arcade. See Figure 2.07-F.

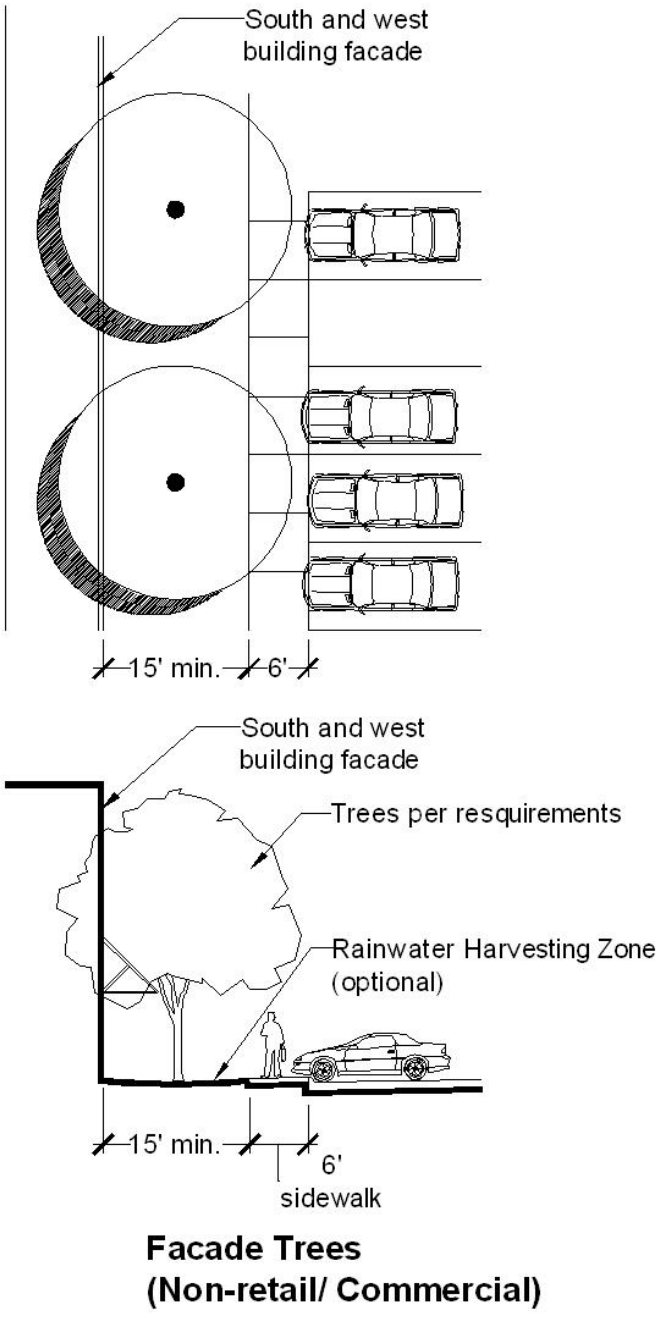


Facade Trees: Retail and Commercial Districts

Figure 2.07-F

b. All Other Districts: Shade trees shall be placed within a minimum fifteen (15) foot wide landscape area (No sidewalk required). See Figure 2.07-G.

c. Trees shall be placed along the south and west building facades where feasible. See Figure 2.07-G.

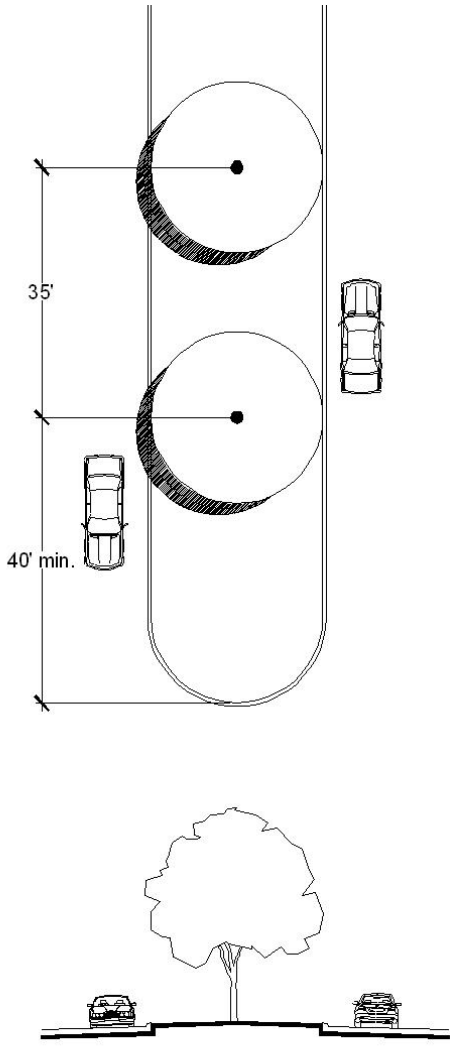


Facade Trees
(Non-retail/ Commercial)

Figure 2.07-G

C. Right-of-way (ROW) landscape.

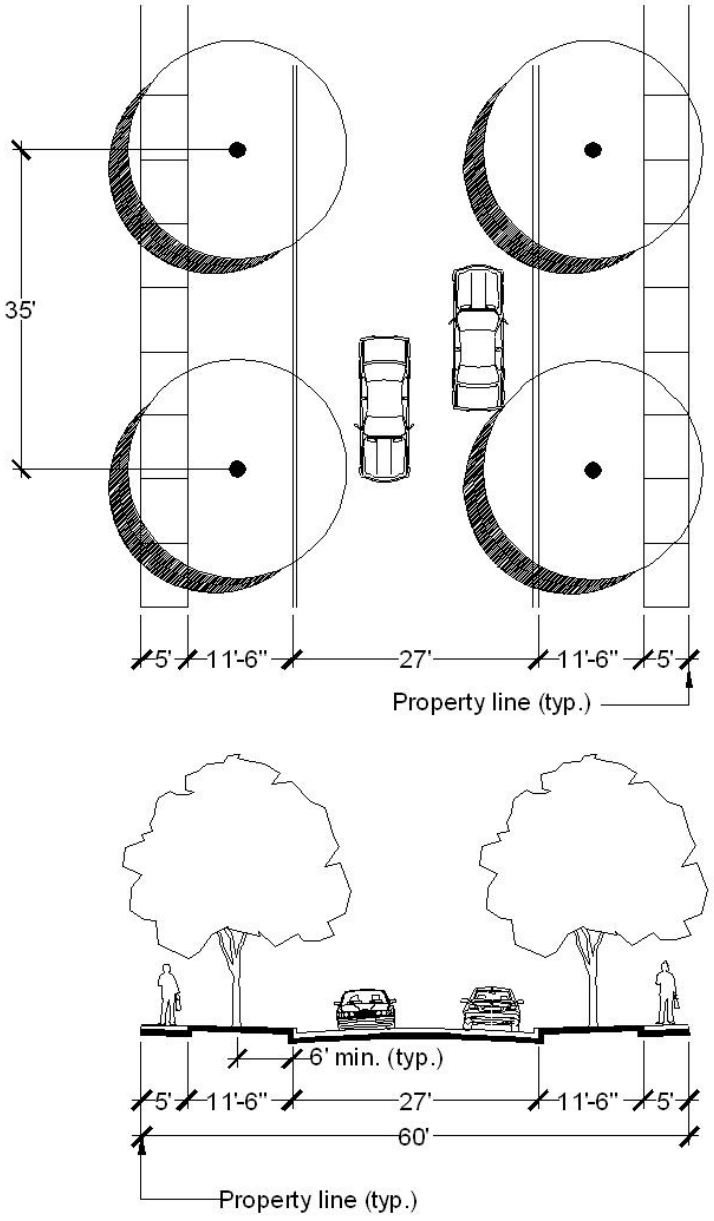
1. Developments having frontage on a divided Type 'A' and 'B' thoroughfares are required to provide escrow funds for one three-inch (3") caliper large tree per seventy (70) linear feet for each side of the street.
2. Trees shall not be planted in the ROW, except for medians and street trees, unless approved by the Director. See Figure 2.07-H.



Median Tree Planting

Figure 2.07-H

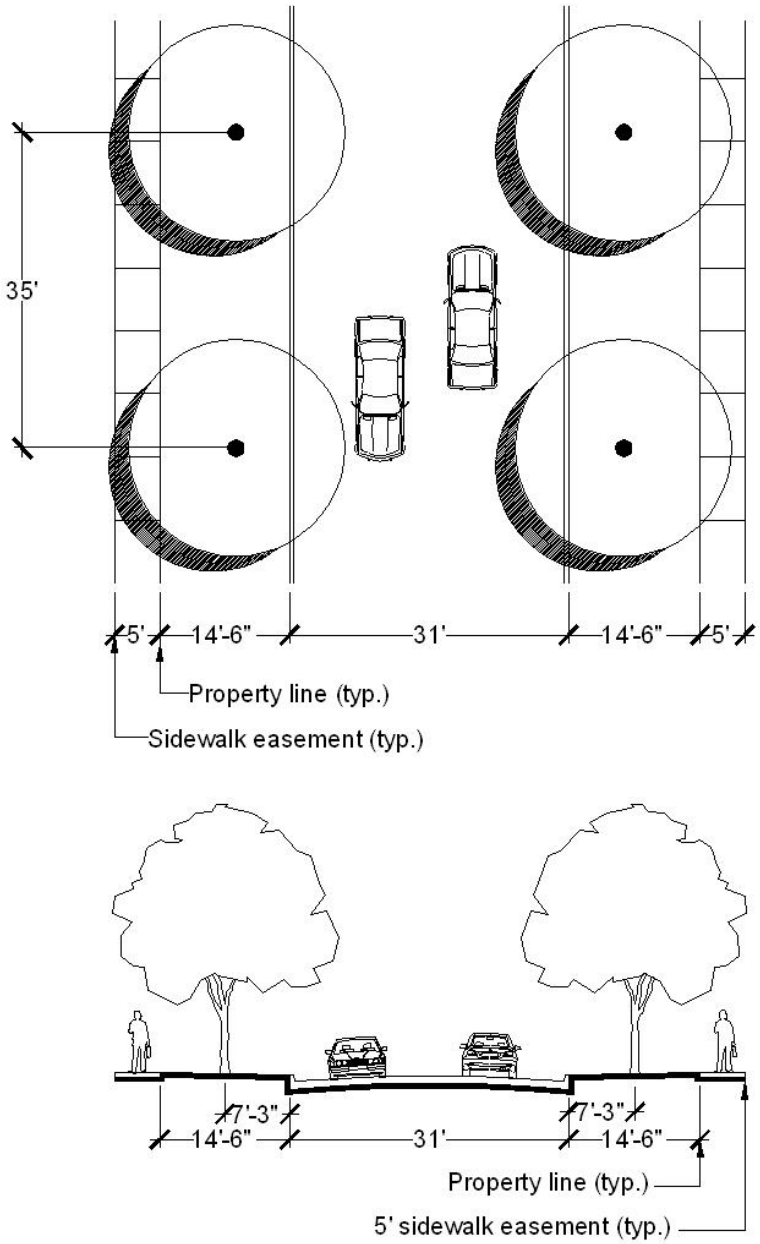
3. Residential developments with street trees shall provide a minimum sixty (60) feet ROW with twenty-seven (27) feet street pavement, for rear entry product. See Figure 2.07-I.



Street Trees: Rear Entry

Figure 2.07-I

4. Residential developments with street trees shall provide a minimum sixty (60') feet ROW with five (5') feet sidewalk easement on both sides of the street for front entry products. See Figure 2.07-J.



Street Trees: Front Entry

Figure 2.07-J

5. ROW street tree standards include:
    a. Three and one-half inch (3 ½") caliper shade trees within the ROW at thirty-five (35) feet on center.
    b. Planting six (6) feet from back of curb.
    c. A tree plan with no more than forty-five percent(45%) of a single trees species.
6. All ROW landscape areas shall be maintained by the adjacent land owner.
7. Landscape installation shall comply with City Engineering standards, unless otherwise directed.

D. Plant Material Size Standards.

Description	Size	Height	Spacing	Standard
Large Trees	3" cal.	12 ft	50 ft*	40 ft. crown at maturity
Medium Trees	3" cal.	12 ft	30 ft*	20 ft. crown at maturity
Small Ornamental Trees	3" cal.	7 ft	15 ft	10 ft. crown at maturity
Parking lot screen	5 gal.	2 ft	3 ft	Form solid visual screen, 3ft. tall, within 1 year of planting
Living screen, conifer	7 gal.	6 ft	8 ft	6 ft. high in two growing seasons
Shrubs & ornamental grasses	5 gal.	2 ft.	Varies	2 ft. high at planting
Perennials, groundcover	varies	varies	Varies	Complete coverage/ 2 yrs
Hydro-seed / native seed mixes	-	-	-	Complete coverage/ 60 days

*unless other wise noted

E. Plant material substitutions.

Substitutions/ trees	Ornamental trees maybe substituted for Large Trees at the rate of three ornamental trees for each Large Tree (3:1)/ subject to the Landscape Architect
Substitution/ shrubs	One (1) five gallon (5 gal.) shrub = Two (2) three gallon (3 gal.) or four (4) two gallon (2 gal.)/ subject to the Planning & Development Services Landscape Architect.

F. Tree planting standards.

1. Tree plantings shall not include more that forty-five percent (45%) of the same tree species.
2. Four (4) feet minimum trunk distance from concrete pavement, utility lines, screening walls, or others structures unless approved or otherwise noted. Final locations of trees are subject to approval by the Landscape Architect.

3. Tree maintenance:

   a. Trees and shrubs shall not overhang or encroach upon walkways, drives, parking areas, and traffic signs to the extent that they interfere with the intended use of these facilities.

   b. Trees shall be limbed up to a height of at least eight (8') feet above the sidewalk level. Tree limbs which overhang the public street shall be limbed up to the height of at least thirteen (13) feet above the street level.

2.08 APPROVED PLANT MATERIALS

Plants shall be selected for the appropriate Landscape Zone as noted in the following tables. Other species may be utilized with approval from the Senior Landscape Architect. Artificial plants are expressly prohibited.

Trees (large shade)				**Natural Landscape**	**Rainwater harvest**	**Oasis**
Common Name	**Botanical Name**	**Size**	**Remarks**			
Oak, Burr	*Quercus macrocarpa*	80' h 80' w	Native	●	●	
Oak, Chinkapin	*Quercus muhlenbergii*	80' h 80' w	Native	●		
Oak, Live*	*Quercus virginiana*	90' h 90' w	Native	●		
Oak, Red	*Quercus shumardii*	80' h 60' w	Native		●	
Pecan	*Carya illinoinensis*	100' h 100' w	Native	●	●	

* Not approved for street trees within ROW

Trees (medium shade)				**Natural Landscape**	**Rainwater harvest**	**Oasis**
Common Name	**Botanical Name**	**Size**	**Remarks**			
Ash, Texas	*Fraxinus texensis*	50' h 40' w	Native	●	●	
Bald Cypress*	*Taxodium distichum*	80' h 50' w	Native	●	●	●
Elm, Cedar	*Ulmus crassifolia*	90' h 80' w	Native	●	●	●
Elm, Allee Lacebark	*Ulmus parivifoia 'Elmer II'*	75' h 50' w	Adapted	●	●	●
Elm, Bosque	*Ulmus parivifoia 'UPMTFI'*	60' h	Adapted	●	●	●

Lacebark		40' w				

Trees (medium shade)				**Natural Landscape**	**Rainwater harvest**	**Oasis**
Common Name	**Botanical Name**	**Size**	**Remarks**			
Magnolia, Southern	*Magnolia grandiflora*	60' h 30' w	Native E. TX		●	●
Maple, Bigtooth	*Acer grandidentatum*	50' h 40' w	Native W. TX	●	●	
Maple, Caddo	*Acer saccharum 'Caddo'*	60'h 30' w	Native	●	●	
Oak, Durand	*Quercus sinuata var. sinuata*	60' h 40' w	Native	●		
Persimmon, Common	*Diospyros virginiana*	60' h 30' w	Native	●		
Pistachio, Chinese	*Pistacia chinensis*	70' h 50' w	Adapted	●	●	●
Black Locust	*Robinia pseudoacacia*	40' h 40' w	Adapted	●		

* Not approved for street trees within ROW

<u>Trees (Small Ornamental)</u>				**Natural Landscape**	**Rainwater harvest**	**Oasis**
Common Name	**Botanical Name**	**Size**	**Remarks**			
American Smoke Tree	*Cotinus obovatus*	25' h 25' w	Native	●		
Buckeye, Mexican	*Ungnadia speciosa*	20' h 20' w	Native	●		
Carolina Buckthorn	*Rhamnus caroliniana*	15'h 15' w	Native	●	●	
Desert Willow	*Chilopsis linearis*	30' h 25' w	Native	●		
Crape Myrtle	*Lagerstroemia indica*	25' h 15' w	Adapted	●		●
Dogwood (Rough-leaf)	*Cornus drummondii*	15' h 15' w	Native	●		
Eastern Red Cedar	*Juniperus virginiana*	40' h 20' w	Native	●		
Eve's Necklace	*Sophora affinis*	30' h 20' w	Native	●	●	

Trees (Small Ornamental)				**Natural Landscape**	**Rainwater harvest**	**Oasis**
Common Name	**Botanical Name**	**Size**	**Remarks**			
Flameleaf Sumac	*Rhus lanceolata*	30' h 20' w	Native	●		
Goldenball Lead Tree	*Leucaena retusa*	25' h 15' w	Native	●		
Goldenrain Tree	*Koelreuteria paniculata*	30' h 20' w	Adapted	●		●
Hawthorn, Washington	*Crataegus phaenopyrum*	25' h 15' w	Adapted	●	●	●
Holly, Yaupon	*Ilex vomitoria*	20' h 20' w	Native	●		●
Magnolia, 'Little Gem.'	*Magnolia 'Little Gem'*	15' h 10' w	Adapted		●	●
Maple, Shantung	*Acer trucatum*	25' h 20' w	Adapted	●	●	●
Mexican Plum	*Prunus mexicana*	25' h 25' w	Native	●	●	
Oak, Bigelow	*Quercus sinuata var. breviloba*	40' h 35' w	Native	●		
Oak, Lacey	*Quercus laceyi (Q. glaucoides)*	35' h 30' w	Native	●		
Pear, Callery	*Pyrus calleryana*	25' h 25' w	Adapted		●	●
Persimmon, Texas	*Diospyros texana*	20' h 12' w	Native	●		
Possumhaw	*Ilex decidua*	15' h 8' w	Native	●		
Rusty Blackhaw	*Viburnum rufidulum*	30' h 35' w	Native	●	●	
Texas Redbud	*Cercis Canadensis var 'texensis'*	30' h 30' w	Native	●	●	●

Trees (Living Screen)				Natural Landscape	Rainwater harvest	Oasis
Common Name	**Botanical Name**	**Size**	**Remarks**			
Arizona Cypress	*Cupressus arizonica*	40' h 20' w	Adapted	●		
Eastern Red Cedar	*Juniperus virginiana*	40' h 20' w	Native	●		
Holly, Burford	*Ilex cornuta 'burfordii'*	20' h 15' w	Adapted			●
Holly, Foster	*Ilex x attenuata 'Foster'*	20' h 10' w	Adapted			●
Holly, Nellie R. Stevens	*Ilex x 'Nellie Stevens*	25' h 15' w	Adapted			●
Holly, Yaupon	*Ilex vomitoria*	20' h 20' w	Native	●		●
Magnolia, 'Little Gem.'	*Magnolia 'Little Gem'*	15' h 10' w	Adapted		●	●
Mahonia, Leather Leaf	*Mahonia bealei*	7' h 5' w	Adapted	●		●
Myrtle, Wax	*Myrica cerifera*	15' h 10' w	Native	●	●	●
Pine, Mondell	*Pinus eldarica*	40' h 20' w	Adapted	●		

Shrubs				Natural Landscape	Rainwater harvest	Oasis
Common Name	**Botanical Name**	**Size**	**Remarks**			
Abelia	*Abelia grandiflora*	4' h 4' w	Native		●	●
Agarito	*Berberis trifoliata*	10' h 10' w	Native	●		
American Beautyberry	*Calicarpa americana*	5' h 5' w	Native	●	●	
Apache Plume	*Fallugia paradoxa*	6' h 6' w	Native	●		
Aromatic Sumac	*Rhus aromatica*	6' h 6' w	Native	●		

Shrubs				**Natural Landscape**	**Rainwater harvest**	**Oasis**
Common Name	**Botanical Name**	**Size**	**Remarks**			
Black Dalea	*Dalea frutescens*	4' h 4' w	Native	●		
Damianita	*Compositae Chrysactinia mexicana*	2' h 2' w	Native	●		
Desert Spoon	*Dasylirion wheeleri*	3' h 3' w	Native	●		
Hawthorn, Indian	*Raphiolepsis indica*	3' h 4' w	Adapted			●
Holly, Burford	*Ilex cornuta 'Burfordii Nana'*	5' h 5' w	Adapted			●
Flame Anisacanthus	*Anisacanthus q. wrightii*	4' h 3' w	Native	●		
Texas Kidneywood	*Eysenhardtia texana*	12' h 8' w	Native	●		
Red Yucca	*Hesperaloe parviflora*	3' h 3' w	Native	●		
Texas Sage, Silverado	*Leucophyllum f. 'Silverado'*	4' h 4' w	Native	●		
Soft-leaf Yucca	*Yucca recurvifolia*	5' h 5' w	Native	●		
Twist-leaf Yucca	*Yucca rupicola*	5' h 5' w	Native	●		

Grass/ Turf				**Natural Landscape**	**Rainwater harvest**	**Oasis**
Common Name	**Botanical Name**	**Size**	**Remarks**			
Big Blue Stem	*Andropogon gerardii*	5' h 5' w	Native	●	●	
Blue Grama	*Bouteloua gracilis*	Turf/ Sod	Native	●		
Buffalograss	*Buchloe dactyloides*	Turf/ Sod	Native	●		
Bermuda grass	*Cynodon dactylon*	Turf/ Sod	Adapted			●
Eastern Gamagrass	*Tripsacum dactyloides*	4' h 3' w	Native (Seed)		●	

Grass/ Turf				Natural Landscape	Rainwater harvest	Oasis
Common Name	**Botanical Name**	**Size**	**Remarks**			
Green Sprangletop	*Leptochloa dubia*	3' h 3' w	Native		●	
Muhly, Seep	*Muhlenbergia reverchonii*	2' h 2' w	Native	●	●	
Muhly, Deer	*Muhlenbergia rigens*	3' h 3' w	Native	●	●	
Muhly, Lindheimer	*Muhlenbergia lindheimeri*	4' h 2' w	Native	●		
Indian Grass	*Sorghastrum nutans*	4' h 3' w	Native	●	●	
Little Blue Stem	*Schizachyrium scoparium*	5' h 2' w	Native	●		
Prairie Dropseed	*Sporobolus heterolepis*	5' h 5' w	Native	●		
Prairie Wild Rye	*Elymus canadensis*	3' h 3' w	Native (Seed)		●	
Sideoats Grama	*Bouteloua curtipendula*	3' h 1' w	Native	●		
Switch Grass	*Panicum virgatum*	5' h 5' w	Native	●	●	

Groundcover/ Vines				Natural Landscape	Rainwater harvest	Oasis
Common Name	**Botanical Name**	**Size**	**Remarks**			
Ajuga	*Ajuga reptans*	6" h creeping	Adapted			●
Coral Honeysuckle	*Lonicera sempervirens*	Vine	Native	●		
Crossvine	*Bignonia capreolata*	Vine	Native	●		●
Frog Fruit	*Phyla nodiflora*	12" h spreading	Native	●		
Horseherb	*Calyptocarpus vialis*	10" h 36" w	Native	●		
Liriope	*Liriope muscari*	15" h 12" w	Adapted		●	●

Groundcover/ Vines				Natural Landscape	Rainwater harvest	Oasis
Common Name	**Botanical Name**	**Size**	**Remarks**			
Pigeonberry	*Rivina humilis*	18" h 24" w	Native	●		
Snake Herb	*Acanthaceae Dyschoriste linearis*	6" h 18" w	Native	●		
Trumpet Vine	*Campsis radicans*	Vine	Native	●		
Water Clover	*Marsilea macropoda*	8" h creeping	Native	●	●	
Wooly Stemodia	*Stemodia lanata*	5" h creeping	Native	●		
Wood Violet	*Viola missouriensis*	6" h creeping	Native	●		

Perennials				Natural Landscape	Rainwater harvest	Oasis
Common Name	**Botanical Name**	**Size**	**Remarks**			
Angel Trumpet	*Datura wrightii*	3' h 3' w	Native	●		
Autumn Joy Sedum	*Sedum 'Autumn Joy'*	2' h 2' w	Adapted	●		
Blackeyed Susan	*Rudbeckia hirta*	2' h 2' w	Native (Seed)	●	●	
Blackfoot Daisy	*Melampodium leucanthum*	12" h 12" w	Native	●		
Blazing stars	*Liatris mucronata*	2' h 2' w	Native	●		
Brown-eyed Susan	*Rudbeckia triloba*	3' h 2' w	Native	●	●	
Clasping Coneflower	*Dracopis amplexicalis*	2' h 1' w	Native (Seed)		●	
Chocolate Flower	*Berlandiera lyrata*	1' h 2' w	Native	●		
Cutleaf Daisy	*Englelmannia pinnatifida*	3' h 3' w	Native (Seed)		●	
Fournerve Daisy	*Hymenoxys scaposa*	1' h 1' w	Native	●		

Perennials				Natural Landscape	Rainwater harvest	Oasis
Common Name	**Botanical Name**	**Size**	**Remarks**			
Fall Aster	*Aster longifolia*	3' h 3' w	Native	●		
Globemallow, Scarlet	*Sphaeralcea coccinea*	12" h 12" w	Native	●		
Indian Blanket	*Gailardia pulchella*	12" h 2" w	Native (Seed)	●	●	
Indian Paint Brush	*Castilleja indivisa*	12" h 2" w	Native (Seed)	●	●	
Green-headed Coneflower	*Rudbeckia lanciniata*	4' h 2' w	Native (Seed)		●	
Gregg Dalea	*Dalea greggii*	1' h 4' w	Native	●		
Gregg's Mistflower	*Eupatorium greggii*	2' h 1' w	Native	●		
Illinois Bundleflower	*Desmanthus inllinoensis*	2' h 1' w	Native (Seed)		●	
Maximilian Sunflower	*Helianthus maximilliani*	5' h 3' w	Native (Seed)		●	
Mexican Hat	*Ratibida columnifera*	2' h 1' w	Native (Seed)	●	●	
Lindheimer's Senna	*Senna lindheimeriana*	3' h 3' w	Native	●		
Obedient Plant	*Physostegia virginiana*	4' h 2' w	Native (Seed)	●	●	
Pink Evening Primrose	*Oenothera speciosa*	1' h 1' w	Native (Seed)		●	
Pink Scullcap	*Scutellaria suffrutescens*	1' h 1' w	Native	●		
Plains Coreopsis	*Coreopsis tinctoria*	1' h 1' w	Native (Seed)		●	
Purple Coneflower	*Echinacea purpurea*	2' h 2' w	Native (Seed)	●	●	
Prairie Verbena	*Verbena bipinnitifida*	6" h 18" w	Native	●		
Rockrose, Brazilian	*Parvonia brazilliensis*	3' h 3' w	Adapted	●	●	

Perennials				Natural Landscape	Rainwater harvest	Oasis
Common Name	**Botanical Name**	**Size**	**Remarks**			
Rockrose	*Parvonia lasiopetala*	3' h 3' w	Native	●	●	
Sage, Autumn	*Salvia Greggii*	3' h 2' w	Native	●		
Sage, Big Red	*Salvia penstemonoides*	4' h 3' w	Native (Seed)	●	●	
Sage, Indigo Spires	*Salvia longespicata x farinacea*	4' h 6' w	Native	●	●	
Sage, Mealy Blue	*Salvia farinacea*	2' h 1' w	Native	●		
Sage, Pitcher	*Salvia*	4' h 3' w	Native (Seed)	●	●	
Sage, Russian	*Perovskia atriplicifolia*	4' h 3' w	Adapted	●		
Sage, Scarlet	*Salvia coccinea*	3' h 3' w	Native (Seed)	●	●	
Skeletonleaf Goldeneye	*Viguiera stenoloba*	2' h 2' w	Native	●		
Sundrops	*Calylophus drummondianus*	6" h 12" w	Native	●		
Texas Betony	*Stachys coccinea*	18" h 24" w	Native	●		
Texas Green-eyes	*Berlandiera texana*	4' h 2' w	Native	●		
Texas Lantana	*Lantana horrida*	5' h 5' w	Native	●		
Texas Star Hibiscus	*Hibiscus coccinea*	5' h 3' w	Native	●	●	
Turk's Cap	*Malvaviscus drummondii*	4' h 4' w	Native	●	●	
Whirling Butterflies	*Gaura lindheimeri*	3' h 3' h	Native	●		
Winecup	*Callirhoe involucrata*	1' h 2' w	Native	●		
Zexmenia	*Wedelia hispida*	2' h spreading	Native	●		